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REMARKS

CLAIM OBJECTIONS

Claims 1-31 stand rejected under 35 U.S.C. §102(b) as being unpatentable over U.S. Pat. No. 6,501,427 to Lilly et al. [hereinafter "Lilly"].

Applicants' invention relates to an improved artificial magnetic conductor (AMC), which can be used as an improved ground plane or an antenna (Application p.1, Field of the Invention). The AMC includes a frequency selective surface (FSS), and the properties of the FSS determine the resonance frequency of the AMC. The FSS typically includes a repeated unit cell in a periodic structure. At resonance, the AMC behaves as a perfect magnetic conductor, and reflected electromagnetic waves are in phase with the incident electromagnetic waves (Application, p. 2, lines 6-7). The AMC ground plane can increase the radiated output energy of an antenna, as radiation emitted backwards from the antenna is reflected in phase from the AMC and adds to the forward emitted radiation, due to constructive interference (Application, p. 2, lines 8 – 11).

An AMC is often used as the ground plane for an antenna, as it has improved properties over a conventional metal ground plane, in particular the suppression of surface waves. The antenna in Lilly uses a conventional metal sheet ground plane, and not an AMC ground plane. For example, Figure 14 shows a conventional conductive ground plane 122. (col. 5, lines 49-51).

Lilly describes a patch antenna composed of a segmented patch and MEMS switches (Abstract, first line). In Lilly, the patch shape, and hence stub length, can be changed to adjust the antenna frequency (col. 1, lines 6-10). In this case, the antenna resonance frequency is the emission frequency of the antenna. There is no suggestion in Lilly that any antenna configuration described therein would also have the properties of an AMC. There is no suggestion that any structure described by Lilly would ever function as a magnetic conductor at any frequency. Lilly only mentions using segmented conductors and switches for an emissive antenna structure, not for an AMC.

The Examiner states (Office Action, p. 3, line 17) that a first configuration (col. 1, lines 40-46) provides an artificial magnetic conductor. There is no suggestion in Lilly that any configuration has the property of an AMC. In this case, the mentioned configuration is a microstrip patch antenna, not an AMC.

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Regarding claims 1-7, claim 1 is amended to state that the frequency selective surface is part of an artificial magnetic conductor (AMC). Claims 2 – 8 are dependent on claim 1, and also include this limitation. Regarding claim 3, Lilly does not describe a repeated unit cell pattern. Regarding claim 7, Lilly does not mention fractal arrays, as suggested by the Examiner (Office Action, p. 3, line 15). In particular, Figure 29F fails to show a fractal array. Claim 8 has been amended to refer to a doubly periodic structure, not found in the prior art reference. Hence, as Lilly does not mention an artificial magnetic conductor, claims 1 – 8 are now in condition for allowance.

Regarding claims 9 - 18, claim 9 is amended to state that the frequency selective surface is part of an artificial magnetic conductor (AMC). As discussed above, Lilly does not mention an artificial magnetic conductor. Hence, these claims are also in condition for allowance. Claim 14 is amended to refer to a doubly periodic structure.

Claims 16 – 18 stand objected to as failing to further limit the subject matter of a previous claim (Claim 9). Claim 9 is amended, as discussed above. Claim 16 is amended, and now refers to the case of an AMC used as an electromagnetic reflector. Claim 17 is amended, and now refers to an AMC used as an electromagnetic absorber. Claim 18 is amended, and refers to the AMC used as an antenna ground plane. As described in the Application (e.g. page 18, lines 19 – 13), an AMC according to the Applicant's invention can be used as absorbers and reflectors that need not be part of an antenna system. Hence, claims 9 – 18 are now in condition for allowance.

Regarding claims 19 – 25, these claims refer to an artificial magnetic conductor (AMC). As discussed above, for example in relation to amended claim 1, Lilly does not describe an AMC at all. Regarding claim 23, Lilly does not disclose a repeated unit cell structure. Hence, these claims are in condition for allowance. There was no claim 26 in the original application.

Similarly, claims 27 – 31 also refer to an artificial magnetic conductor (AMC), which is not taught in Lilly. Regarding claim 28, this describes an AMC where the resonance frequency of each region is independently adjustable. There is no such independent adjustment of independent regions in Lilly. Regarding claims 30 and 31, these refer to a tunable dielectric. Lilly does not mention a tunable dielectric. Hence, these claims are in condition for allowance.

Based upon the foregoing amendments and comments, Applicant believes this case is in condition for allowance. Questions regarding this application may be directed to the undersigned

attorney by telephone, facsimile or electronic mail.

Respectfully submitted,

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